

Session D 2017

MARCH 16 – MARCH 17

PG&E is committed to becoming the best-performing utility in the industry, providing our customers with electric and gas service that is affordable, reliable and, above all, safe. Achieving and sustaining this performance requires a comprehensive, data-driven, best-in-class, forward looking approach to risk identification, analysis and management. Toward this end, the accompanying document contains analysis of a broad range of risks that have the potential to affect utility operations. Identification of such risks enables PG&E to prioritize management activities and identify the related investments and revenue requirements necessary for PG&E to provide our customers with industry-leading operations. The risks contained in this document should not be construed to reflect immediate threats to public safety. They do not. Such threats, if known, would be immediately addressed.

Future funding to mitigate these risks is addressed in PG&E's integrated planning and budgeting process. A "red" resource need circle indicates risk areas for which there may be a need to allocate additional resources in the future to mitigate the risk, and does not reflect any immediate shortfall in funding necessary to maintain safe and reliable operations.



Back to Agenda Slide

NOTE: This summary focuses on current challenges only, and excludes progress/successes over the course of the past year.

Wildfire

Risk Status	'16	17	Risk Description: PG&E assets may initiate a wildland fire that is not easily contained and that endangers the public, private property, sensitive lands, and/or						
8 5	0	0	leads to long-duration service outages						
Risk Score	623	791	Driver of Change: Frequency was increased from 30-100 years to 10-30 years, supported by PG&E ignition data and CALFIRE large fire history. PG&E ignition data shows 1 to 2 large fires per year (300 acres or greater). CALFIRE data shows ~5% to 10% of large fires become catastrophic fires (P95 events).						
Control Status	'16	'17	Key Compliance Requirement(s): • Vegetation Management (T&D)						
			 Pole Strength and Loading (T&D) Transmission Line Inspection & Maintenance Distribution Line Inspection & Maintenance Emergency Planning and Response (T&D) 						

Risk and Compliance Challenges

· Risk Challenges

- PG&E's exposure to wildfire risks continues to escalate despite significant ongoing investment in compliance and public safety programs. Extended drought and shifting climate patterns have intensified the challenges associated with forest and wildfire management in California.
- Of the 20 most damaging wildfires published by Cal Fire, 40% (8) have occurred in the last decade with 50% (4) of those occurring in the last two years, three of which were in PG&E's service territory. California utilities are experiencing increased political and regulatory pressure regarding how this risk is being managed.

Compliance Challenges

- · Ongoing state regulatory rulemaking may drive the need for enhancements to compliance controls
- Compliance risk has increased due to the extended drought and pest conditions. In 2016, PG&E's hazard tree removal program mitigated 236,000 trees impacted by bark beetle infestation.
- Recent wildfire events afford opportunities to leverage lessons learned (e.g. Butte Fire)
- Inconsistent processes and controls exist for Transmission Pole Strength & Loading
- Accuracy of Joint Pole asset data continues to be a challenge which may increase the risk of overloaded pole conditions

· LOB Interdependencies

- · Information Technology
- · Regulatory Affairs
- Government Relations

Risk Tolerance

- Status of the risk is currently Amber; further mitigation is required to reduce risk
- The resource ring is currently Red; additional resources may be needed to fund mitigation work and to comply with potential additional compliance requirements that may result from the California Public Utilities
 Commission (CPUC) fire map rulemaking
- Wildfire ignition modeling and alternatives analysis will enable further discussion on risk tolerance based on risk spend efficiency of possible alternatives

Risk Areas of Focus for 2017

 Continuous improvement of wildfire prevention, detection and response capabilities through incorporation of data driven mitigations, exploration of emerging technologies and accepted industry best practices

Compliance Areas of Focus for 2017

- Continue to progress the CEMA program specific to precipitation and tree mortality
- All Things Pole to leverage processes and controls developed for Distribution
- Enhance fire ignition data collection to support better fire mitigation operations and investments
- Continue to enhance Joint Pole program controls



Back to Agenda Slide

Wildfire **Risk Summary**

2017 Control Status



Risk Description:

PG&E assets may initiate a wildland fire that is not easily contained and that endangers the public, private property, sensitive lands, and/or leads to longduration service outages.

Scoring Scenario:

Autility-related fire resulting in multiple losses of life, extensive property damage, and extensive long-term damage to natural resources. These events can also lead to significant fines, claims, and law suits as well as extended regulations.

Strategy to Manage Challenges:

Continuous improvement of wildfire prevention, detection and response capabilities through incorporation of data driven mitigations, exploration of emerging technologies and accepted industry best practices.

Metric D (Metric Status		2016 Metric Status	2016 Target	Metric Trend		Variance Explanation	2017 YTD	2017 YTD Target	2017 EOY Forecast		
Fire Ignitions: Number of powerline-involved fire incidents annually reportable to the CPUC per Decision 14-02-015 T&D Overhead Wires Down: Number of instances where an electric transmission or primary distribution conductor is broken or falls					4 0 5	Same	N/A		5	5	405
					2,572	Worse	• Increas	ed weather days compared to 2015 ed full tree failures due to drought conditions ed vehicle incidents primarily in Central Valley region	277	255	3,050
911 Response Time: Percentage of within 60 minutes after receiving a	98.3%	97.5%	Same		N/A	95.8%	97.5%	97.5%			
Risk Score	Safety	Envir.	Comp.	Rel.	Trust	Fin.	Freq.	Applicable Compliance Work Process/Requirements		Control Statu	
Previous: 623 (2016 Session D)	7	6	5	5	7	6	2	Vegetation Management			0
Current: 791 (2017 Session D)	7	6	5	5	6	6	3	Pole Strength & Loading			0
Justification for Change(s):								Transmission Line Inspection & Maintenance			0
Probability of high impact fire is to conditions. Frequency was increased. Frequency change supporter.	sed from 30-10	0 years to	10-30 years		Distribution Line Inspection & Maintenance			•			
 Frequency change supported by PG&E ignition data and CALFIRE large fire history. PG&E ignition data shows 1 to 2 large fires per year (300 acres or greater). CALFIRE data shows ~5% to 10% of large fires 								Emergency Planning & Response			

- become catastrophic fires (P95 events).
- o Over 102 million dead trees on forested land across the state of California
- 2014, 2015 and 2016 were warmest in recorded history
- Trust impact is not expected to be significant 10 years after event

QUANTIFICATION METHODOLOGY

- Leveraging PG&E specific industry-leading ignition spread modelling to identify highest risk locations for additional mitigations
- · Ignition spread modeling simulates ignitions across the service territory and incorporates climatology, terrain, fuel in a Monte Carlo based computer simulation to help determine probability of catastrophic fires related to our facilities
- Planning to use PG&E ignition data and CALFIRE data to calibrate ignition spread modeling probabilities for catastrophic fire

Status: On-Track: to be completed by 11/30/17





Resources May Be Needed



Current Controls are Not Acequate; Additional Resources Not Actidipated



ALTERNATIVES ANALYSIS

- Distribution reclosing cutout procedures implemented based on alternatives analysis considering targeting of Top 5%, 10% or 20% of Wildfire risk map on days when wildfire threat is indexed Very High or Extreme
- Utilizing ignition spread modeling to target work and quantify reduction in P95 probability for mitigation bundles in RAMP
- · Incorporating prioritization of routine work and corrective actions in high wildfire risk areas

Status: On-Track: to be completed by 11/30/17

Resources Not Anticipated



Adequate; Additional

RISK TOLERANCE

- · Status of the risk is currently Amber; further mitigation is required to reduce risk
- The resource ring is currently Red; additional resources may be needed to fund mitigation work and to comply with new anticipated compliance requirements related to the Fire OIR
- · Wildfire ignition modeling and alternatives analysis will enable further discussion on risk tolerance based on risk spend efficiency of possible alternatives

Status: On-Track: to be completed by 11/30/17

Compliance Control Status:

RED: Current controls are not adequate AMBER: Controls are being strengthened

